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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,715	01/11/2001	Kenneth Lloyd Westra	THOLAM P139US	9530

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT PAPER NUMBER

2872

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/758,715

Applicant(s)

WESTRA ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872

-- Th MAILING DATE of this communication app ars on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26,28,29,31-40 and 42-62 is/are pending in the application.
- 4a) Of the above claim(s) 1-24,26,28,29,31-40,42-44 and 46-62 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25 and 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 31 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120 .

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7. 6) ☐ Other:

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 1/31/03 in Paper No. 8 have been approved.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Page 11, line 1; Page 19, lines 15-20- Reference numeral 48 not in Figures 16 and 17

Page 11, lines 13-37- Reference numeral 20 not in Figures 18a-18b.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Response to Amendment

3. The submission of a substitute specification for the disclosure in Paper No. 9, dated 1/31/03, is acknowledged and accepted.

4. The cancellation of Claims 27, 30, and 41 in Paper No. 10, dated 1/31/03, is acknowledged and accepted.

5. The amendments to Claims 25 and 45 in Paper No. 10, dated 1/31/03, are acknowledged and accepted.

Response to Arguments

Art Unit: 2872

6. The Applicants argue that Stanley fails to teach or reasonably suggest the mirror surface being co-extensive with a selectively anisotropically etched portion of the crystalline plane, as recited in newly amended Claims 25 and 45. After careful consideration of the Stanley reference, the Examiner agrees, and respectfully withdraws the rejections to Claims 25, 27, 30, 41, and 45. However, upon further consideration, a new ground(s) of rejection to Claims 25 and 45 follow.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 25 and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al.

Smith et al. discloses a high reflectivity micro mirror (See Figure 2), comprising a monolithic bulk crystal silicon (See 14 in Figure 2) having an anisotropic body (inherently, bulk crystal silicon has an anisotropic body with multiple crystalline planes, each crystalline plane etching at different etch rates due to the differing atom densities and bonding structures of each crystalline planes) with a crystalline plane (in the instant case, the crystalline plane is taken to be the plane defined by reflector 16 in Figure 2), and a mirror surface (See 16 in Figure 2) co-extensive with a selectively anisotropically etched portion of the crystalline plane. Additionally, Smith et al. discloses an inlet

passage (See for example 22 in Figure 2) and an outlet passage (See for example 30 in Figure 2) which intersect at the selectively exposed portion of the crystalline plane.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 25 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stanley in view of Madou.

Stanley discloses a high reflectivity micro mirror (See Figure 2), comprising a monolithic bulk crystal silicon (See 14 in Figure 2) having an anisotropic body (inherently, bulk crystal silicon has an anisotropic body with multiple crystalline planes, each crystalline plane etching at different etch rates due to the differing atom densities and bonding structures of each crystalline planes) with a crystalline plane (in the instant case, the crystalline plane is taken to be the plane defined by reflector 16 in Figure 2), and a mirror surface (See 16 in Figure 2) co-extensive with a selectively exposed portion of the crystalline plane. Additionally, Stanley discloses an inlet passage (See for example 22 in Figure 2) and an outlet passage (See for example 30 in Figure 2) which intersect at the selectively exposed portion of the crystalline plane. Stanley lacks the mirror surface being co-extensive with a selectively *anisotropically etched* portion of the crystalline plane. However, Madou teaches a method of anisotropically etching vertical sidewalls in

Art Unit: 2872

bulk silicon by properly aligning the mask opening with particular planar orientations of the bulk silicon (See pages 149-153 on a discussion of anisotropic etching of [100]-oriented bulk silicon, and in particular, pages 151-152 and Figures 4.9 and 4.10 with regards to etching vertical (90 deg.) sidewalls instead of sloped (54.74 deg.) sidewalls). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the mirror surface be co-extensive with a selectively *anisotropically etched* portion of the crystalline plane, as taught by Madou, in the high reflectivity micro mirror of Stanley. One would have been motivated to do this to take advantage of existing lithographic methods for patterning on bulk silicon, as well as existing well-known anisotropic etchants, such as potassium hydroxide (KOH) or tetramethyl ammonium hydroxide (TMAH).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any


Art Unit: 2872

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.


Arnel C. Lavarias
March 10, 2003

